In re Patent Application of:
JOFFE ET AL.
Serial No. **09/997,228**
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In the Claims:

1. (CURRENTLY AMENDED) A synthetic impedance driver circuit for driving a load comprising:

an input port adapted to receive an input signal to be coupled to said load;

an output port adapted to apply an output signal to said load and including an output current node; and

an operational amplifier having an input coupled to said input port and a single output, wherein said single output is operatively coupled to said output port, over a circuit path through which an output impedance of said driver circuit is synthesized, said circuit path being exclusive of one or more series-coupled electrical energy-dissipative elements, so that said synthesized output impedance of said driver circuit is defined essentially exclusive of series-coupled electrical energy-dissipative elements, and including an output voltage feedback device coupled between the output port and an input of the operational amplifier circuit, a current mirror circuit coupled between the output port and input of the operational amplifier and operative to feedback a current representative of the output current applied to the output port such that the synthesized output impedance is defined in accordance with the feedback current, a current mirror node that tracks output voltage at the current output node and a second operational amplifier <u>as a feedback amplifier and</u> having an input coupled to the output current node and another input coupled to the current mirror node <u>and having an output operatively connected to said current mirror circuit to aid in</u> removing current mirror distortion for values of load resistance.

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4. (CURRENTLY AMENDED) A synthetic impedance driver circuit according to Claim 1, further including an output coupling circuit having an input coupled to said output of said operational amplifier and level-shifted outputs, and ~~wherein said current~~ a current sensing circuit that includes complementary polarity output transistor circuits, respectively coupled between said level-shifted outputs of said output coupling circuit and said output port, and complementary polarity current mirror transistor circuits respectively coupled between said complementary polarity output transistor circuits and an input of said operational amplifier.

5. (ORIGINAL) A synthetic impedance driver circuit according to claim 4, wherein said output coupling circuit includes a level shifter.

6. (CURRENTLY AMENDED) A synthetic impedance driver circuit according to claim 5, wherein said operational amplifier has a first polarity input to which said input signal and ~~said output~~ including an output voltage feedback resistor ~~are coupled~~ coupled thereto, and a second polarity input to which a reference voltage is coupled.

7. (ORIGINAL) A synthetic impedance driver circuit according to claim 6, wherein said complementary polarity current mirror circuits have a first common node coupled to said first polarity input of said operational amplifier.

8. (ORIGINAL) A synthetic impedance driver circuit according to claim 7, wherein said complementary polarity output transistor circuits have a second common node coupled to said output port.

9. (CURRENTLY AMENDED) A synthetic impedance driver circuit according to Claim 1, wherein said operational amplifier has a first polarity input to which said input signal and ~~said output~~ an output voltage feedback resistor are coupled, and a second polarity input to which a reference voltage is coupled.

10. (CURRENTLY AMENDED) A synthetic impedance driver circuit according to Claim 1, wherein said operational amplifier circuit has a first polarity input to which said input signal is coupled, and a second polarity input to which ~~said output~~ an output voltage feedback resistor and said feed back current are coupled.

11. (CURRENTLY AMENDED) A synthetic impedance driver circuit comprising an operational amplifier having a single output, and a first input coupled to receive an input signal, a second input coupled to a reference voltage, an output port adapted to supply an output signal to the load and including an output current node, and a voltage feedback resistor

coupled between an output port and an input of said amplifier, an output current-dependent current source as a current mirror circuit, which is operative to supply a prescribed fraction k of output current at said output port over a current feedback path to an input of said operational amplifier, such that the output impedance of said synthetic impedance driver circuit is synthesized in terms of the mirror current ratio k and the value of said output voltage feedback resistor, and including an output voltage feedback device coupled between the output port and an input of the operational amplifier circuit, wherein said current mirror circuit coupled between the output port and input of the operational amplifier and operative to feedback a current representative of the output current applied to the output port such that the synthesized output impedance is defined in accordance with the feedback current, a current mirror node that tracks output voltage at the current output node and a second operational amplifier as a feedback amplifier and having an input coupled to the output current node and another input coupled to the current mirror node and having an output operatively connected to said current mirror circuit to aid in removing current mirror distortion for values of load resistance.

12. (ORIGINAL) A synthetic impedance driver circuit according to claim 11, wherein said operational amplifier has an output coupled to said output port over a circuit path through which said output impedance of said driver circuit is synthesized, said circuit path being exclusive of one or more series-coupled electrical energy-dissipative elements, so that said synthesized output impedance of said driver circuit is

defined exclusive of series-coupled electrical energy-dissipative elements.

13. (ORIGINAL) A synthetic impedance driver circuit according to claim 12, wherein said operational amplifier is coupled by way of an output coupling circuit to said output port, said output coupling circuit including a level shifter having a first and second level-shifted outputs, respectively coupled to first and second complementary polarity output transistors coupled to said output port, and associated complementary current mirror transistors having a current mirror node supplying said prescribed fraction k of output current at said output port to an input of said operational amplifier.

14. (ORIGINAL) A synthetic impedance driver circuit according to claim 12, wherein an input signal is coupled to a non-inverting input of said operational amplifier.

15. (ORIGINAL) A synthetic impedance driver circuit according to claim 13, wherein a first auxiliary resistor is coupled in a mirrored current feedback path to an input of said operational amplifier, and wherein a current mirror node is coupled through a second auxiliary resistor to a reference voltage applied to a non-inverting input of said amplifier.

16. (ORIGINAL) A synthetic impedance driver circuit according to claim 13, further including a feedback operational amplifier having inputs respectively coupled to said output port and to said current mirror node, and an

output coupled as a control input to a feedback transistor having its current flow path coupled to power supply terminals for said driver circuit through a first auxiliary current mirror circuit and a first auxiliary bias current source, said first auxiliary bias current source maintaining said feedback transistor in a conductive state for both polarities of output current, and a second auxiliary current mirror circuit coupled to said current mirror circuit and to the inverting input of said driver amplifier circuit, to which a second auxiliary bias current source is coupled.

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